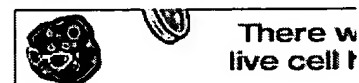


# Cell


[Home](#) [Search](#) [Archive](#) [Subscribe](#)
[Feedback](#)

 Subscriber: US Patent and Trademark Office | [Sign In as Individual](#) | [Register as Individual](#)

 Copyright © 1995 by Cell Press  
 Cell, Vol. 80, 155-165, January, 1995

## Identification and Characterization of a Spinal Muscular Atrophy-Determining Gene

S. Lefebvre, L. Burglen, S. Reboullet, O. Clermont, P. Burlet, L. Viollet, B. Benichou, C. Cruaud, P. Millasseau, and M. Zeviani

Unité de Recherches sur les Handicaps Génétiques de l'Enfant, Institut National de la Santé et de la Recherche Médicale, Institut Necker, Hôpital des Enfants Malades, Paris, France

[▶ Table of Contents](#)
[▶ This article has been cited by: other online articles](#)
[▶ Search Medline for articles by:](#)
[S. Lefebvre](#) | [M. Zeviani](#)
[▶ Download to Citation Manager](#)

Spinal muscular atrophy (SMA) is a common fatal autosomal recessive disorder characterized by degeneration of lower motor neurons, leading to progressive paralysis with muscular atrophy. The gene for SMA has been mapped to chromosome 5q13, where large-scale deletions have been reported. We describe here the inverted duplication of a 500 kb element in normal chromosomes and narrow the critical region to 140 kb within the telomeric region. This interval contains a 20 kb gene encoding a protein of 294 amino acids. An highly homologous gene is present in the centromeric element of 95% controls. The telomeric gene is either lacking or interrupted in 226 of 229 patients, and patients retain this gene (3 of 229) carry either a point mutation (Y272C) or short deletions in the consensus splice sites of introns 6 and 7. These data suggest that this gene, termed the survival motor neuron (SMN) gene, is the SMA-determining gene.

[▶ Table of Contents](#)
[▶ Search Medline for articles by:](#)
[S. Lefebvre](#) | [M. Zeviani](#)
[▶ Download to Citation Manager](#)

### This article has been cited by the following articles:

- Cox, Gregory A., Mahaffey, Connie L., and Frankel, Wayne N. (1998). Identification of the Mouse Neuromuscular Degeneration Gene and Mapping of a Second Site Suppressor Allele. *Neuron* 21:1327 [Summary] [Full Text]
- Pettmann, Brigitte and Henderson, Christopher E. (1998). Neuronal Cell Death. *Neuron* 20:633 [Full Text]
- Dreyfuss, Gideon, Hentze, Matthias, and Lamond, Angus I. (1996). From Transcript to Protein. *Cell* 85:963 [Full Text]
- Friesen, Westley J., Massenet, Severine, Paushkin, Sergey, Wyce, Anastasia, and Dreyfuss, Gideon (2001). SMN, the Product of the Spinal Muscular Atrophy Gene, Binds Preferentially to Dimethylarginine-Containing Protein Targets. *Molecular Cell* 7:1111-1117 [Summary] [Full Text]

[Immunity](#) [Neuron](#) [Molecular Cell](#) [Structure](#) [Current Biology](#) [Developmental Cell](#)

Cell

A Scientific Breakthrough

[Home](#) [Search](#) [Archive](#) [Subscribe](#)
[Feedback](#)

 Subscriber: US Patent and Trademark Office | [Sign In as Individual](#) | [Register as Individual](#)

Copyright © 1995 by Cell Press

Cell, Vol. 80, 167–178, January, 1995

## The Gene For Neuronal Apoptosis Inhibitory Protein Is Partially Deleted in Individuals with Spinal Muscular Atrophy

N. Roy, M. S. Mahadevan, M. McLean, G. Shutler, Z. Yaraghi, R. Farahani, S. Baird, A. Besner-Johnston, C. Lefebvre, and X. Kang

Molecular Genetics Laboratory, Children's Hospital of Eastern Ontario, Ottawa, Canada

[Table of Contents](#)

 This article has been cited by: [other online articles](#)
[Search Medline for article:](#)
[N. Roy | X. Kang](#)
[Download to Citation Manager](#)

The spinal muscular atrophies (SMAs), characterized by spinal cord motor neuron depletion, are among the most common autosomal recessive disorders. One model of SMA pathogenesis invokes an inappropriate persistence of normally occurring motor neuron apoptosis. Consistent with this hypothesis, the novel gene for neuronal apoptosis inhibitory protein (NAIP) has been mapped to the SMA region on chromosome 5q13.1 and is homologous with baculoviral apoptosis inhibitor proteins. The two first coding exons of this gene are deleted in approximately 67% of type I SMA chromosomes compared with 2% of non-SMA chromosomes. Furthermore, RT-PCR analysis reveals internally deleted and mutated forms of the NAIP transcript in type I SMA individuals and not in unaffected individuals. These findings suggest that mutations in the NAIP locus may lead to a failure of a normally occurring inhibition of motor neuron apoptosis resulting in or contributing to the SMA phenotype.

[Table of Contents](#)
[Search Medline for articles by](#)
[N. Roy | X. Kang](#)
[Download to Citation Manager](#)

### This article has been cited by the following articles:

- Vaux, David L. and Korsmeyer, Stanley J. (1999). Cell Death in Development. *Cell* 96:245 [Full Text]
- Vucic, Domagoj, Stennicke, Henning R., Pisabarro, Maria Teresa, Salvesen, Guy S., and Dixit, Vishva M. (2000). ML-IAP, a novel inhibitor of apoptosis that is preferentially expressed in human melanomas. *Current Biology* 10:1359-1366 [Summary] [Full Text]

[Immunity](#) [Neuron](#) [Molecular Cell](#) [Structure](#) [Current Biology](#) [Developmental Cell](#)


Neuron

Cell Content...

Copyright © 2001 by Cell Press.

